

Honors Algebra II  
Chapter 8 Quiz Review  
Series and Sequences

Name Key

Tell whether the sequence is arithmetic. Explain your reasoning.

1. 100, 50, 25, 12.5, 6.25, ...

No; no common difference

2.  $\frac{3}{10}, \frac{3}{5}, \frac{9}{10}, \frac{6}{5}, \frac{3}{2}, \dots$

yes; common difference of  $\frac{3}{10}$

Write a rule for the  $n$ th term of the sequence. Then find  $a_{20}$

3. 37, 29, 21, 13, ...

$$a_n = a_1 + (n-1)d$$

$$a_n = 37 + (n-1)(-8)$$

$$a_n = 37 - 8n + 8$$

$$a_n = -8n + 45$$

$$a_{20} = -115$$

4.  $-4, -\frac{8}{3}, -\frac{4}{3}, 0, \dots$

$$a_n = -4 + (n-1)\left(\frac{4}{3}\right)$$

$$a_n = -4 + \frac{4}{3}n - \frac{4}{3}$$

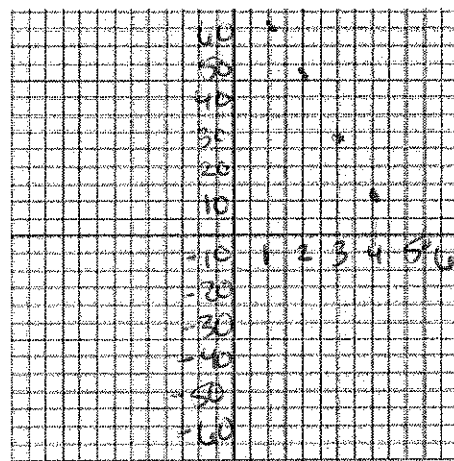
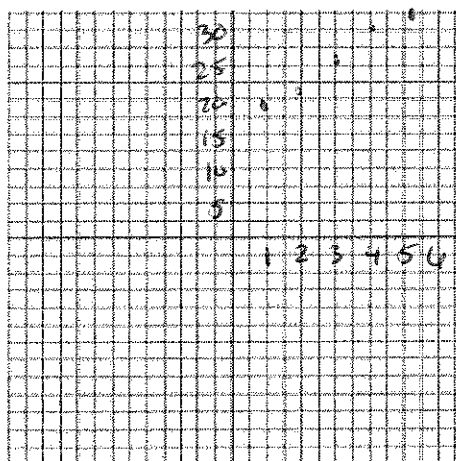
$$a_n = \frac{4}{3}n - \frac{16}{3}$$

$$a_{20} = \frac{64}{3}$$

Write a rule for the  $n$ th term of the sequence. Then graph the first six terms of the sequence.

5.  $a_{23} = 107, d = 4$

6.  $a_9 = -73, a_{14} = -158$



$$107 = a_1 + (23-1)(4)$$

$$a_n = 4n + 15$$

$$107 = a_1 + 88$$

$$19 = a_1$$

$$a_n = 19 + (n-1)(4)$$

$$a_n = 19 + 4n - 4$$

n	a_n
1	19
2	23
3	27
4	31
5	35
6	39

$$-73 = a_1 + (9-1)d$$

$$-158 = a_1 + (14-1)d$$

$$a_n = 63 + (n-1)(-17)$$

$$a_n = 63 - 17n + 17$$

$$a_n = -17n + 80$$

n	1	2	3	4	5	6
a_n	63	46	29	12	-5	-22

$$-73 = a_1 + 8d$$

$$-158 = a_1 + 13d$$

$$85 = -5d$$

$$-17 = d$$

$$-73 = a_1 + 8(-17)$$

$$63 = a_1$$

Tell whether the sequence is geometric. Explain your reasoning.

7. 3, 6, 18, 72, 360, ...

No, no common ratio

8. 0.7, 3.5, 17.5, 87.5, 437.5, ...

Yes, common ratio of 5

Write a rule for the  $n$ th term of the sequence. Then find  $a_7$ .

9. 9, 18, 36, 72, ...

$$a_n = a_1 r^{n-1}$$

$$a_n = 9(2)^{n-1}; a_7 = 576$$

10. 1.2, -2.4, 4.8, -9.6, ...

$$a_n = 1.2(-2)^{n-1}; a_7 = 76.8$$

Write a rule for the  $n$ th term of the sequence. Then graph the first six terms of the sequence.

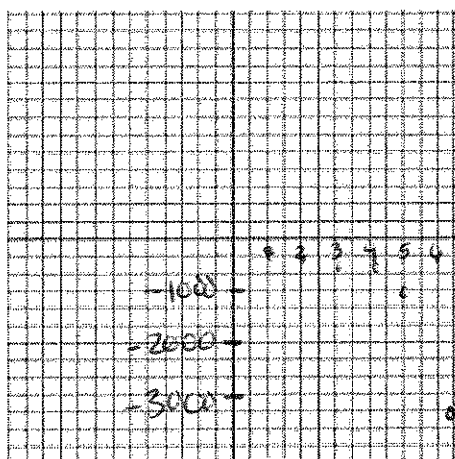
11.  $a_4 = -378, r = 3$

$$a_n = a_1 r^{n-1}$$

$$-378 = a_1 (3)^{4-1}$$

$$-378 = a_1 (27)$$

$$-14 = a_1$$



$$a_n = -14(3)^{n-1}$$

n	1	2	3	4	5	6
$a_n$	-14	-42	-126	-378	-1134	-3402

Find the sum.

$$S_n = n \left( \frac{a_1 + a_n}{2} \right)$$

$$a_1 = 4.1 + 0.4(1) = 4.5$$

$$a_{39} = 4.1 + 0.4(39) = 19.7$$

13.  $\sum_{i=1}^{39} (-4.1 + 0.4i)$

$$S_{39} = 39 \left( \frac{4.5 + 19.7}{2} \right)$$

$$S_{39} = 471.9$$

12.  $a_2 = -72, a_6 = -\frac{1}{18}$

$$-72 = a_1 r^{2-1}$$

$$-\frac{1}{18} = a_1 r^{6-1}$$

$$-72 = a_1 r$$

$$-\frac{1}{18} = a_1 r^5$$

$$a_1 = -\frac{72}{r}$$

$$-\frac{1}{18} = \left( -\frac{72}{r} \right) r^5$$

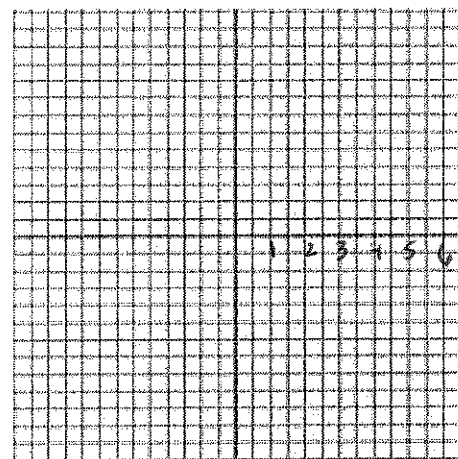
$$-\frac{1}{18} = -72r^4$$

$$\frac{1}{1296} = r^4$$

$$\sqrt[4]{\frac{1}{1296}} = r$$

$$a_1 = -\frac{72}{(\frac{1}{6})}$$

$$a_1 = -432$$



$$a_n = -432 \left( \frac{1}{6} \right)^{n-1}$$

n	1	2	3	4	5	6
$a_n$	-432	-72	-12	-2	-1/3	-1/18

$$S_n = a_1 \left( \frac{1-r^n}{1-r} \right)$$

14.  $\sum_{i=1}^8 5 \left( \frac{1}{3} \right)^{i-1}$

$$S_8 = 5 \left( \frac{1 - (\frac{1}{3})^8}{1 - (\frac{1}{3})} \right)$$

$$S_8 = \frac{16400}{2187}$$